

FURTHER NOTES ON STENOCHLÆNA, LOMARIOPSIS AND TERATOPHYLLUM.

By R. E. HOLTUM.

In this Bulletin, Vol. 5, nos. 9-11 (1932), I gave an account of the above genera, based on all the material then available to me. It subsequently appeared that the bulk of the specimens of "*Stenochlæna*" from the Herbarium of the Bureau of Science, Manila, had previously been sent to the U.S. National Herbarium on loan and were not with the material I had for study from Manila in 1932. Some of the Philippine collections were represented by duplicates at Buitenzorg, and in the Singapore herbarium, but a great many were not. I was therefore very glad of the opportunity of examining the full Manila collections, which has been possible through the courtesy of Dr. W. R. Maxon of the U.S. National Herbarium and Dr. Quisumbing of the Philippine National Herbarium. At the same time, Dr. Maxon sent me on loan the specimens from the U.S. National Herbarium, which in some cases supplied further information.

The result of the examination of these additional specimens is that I am able to add a few notes about the Philippine species of the three genera, and I am able also to correct a misapplication of the name *Lomariopsis leptocarpha*. My thanks are due to Dr. Maxon and Dr. Quisumbing, and also to the authorities of the herbaria at Kew and the British Museum, where I discovered some further specimens during my leave to Europe in 1934.

This paper contains the new combination *Teratophyllum leptocarpum* (Fée) Holttum.

STENOCHLÆNA.

S. fraxinifolia Presl, Epimel. 164. 1849.

The type of this is Cuming 347 from Negros. There is a specimen (including fertile frond) in the British Museum herbarium and another in the U.S. National Herbarium; I can see no distinction from *S. palustris*. The characters mentioned by Presl seem to me of little diagnostic value.

S. juglandifolia Presl, Epimel. 164. 1849.

Lomaria? *juglandifolia* Presl, Rel. Hænk. 1: 52.

Stenochlæna Milnei Und. Bull. Torr. Bot. Cl. 33: 38. 1906.

The type of this species is a specimen of Hænke's from Luzon; I have not seen it. In *Epimel. bot.* Presl quotes also Cuming 133 *partim*. Cuming 133 is also quoted under *Stenochlæna scandens* (the species now called *S. palustris*) both by Presl and John Smith (Journ. Bot. 3: 401).

All the specimens of Cuming 133 which I have seen (in the herbaria of Kew, the British Museum, and Dr. E. B. Copeland) are identical, and are intermediate in character between *S. palustris* and *S. laurifolia*. There are some remarks on the subject in this Bulletin Vol. 5, p. 258. I now find that these specimens agree with *S. Milnei*, a species overlooked when preparing my former paper, the type of which I have examined at Kew. The question therefore arises as to whether *S. juglandifolia* and *S. Milnei* are synonymous.

The principal characters distinguishing *S. Milnei* from *S. palustris* are the broadly rounded bases of the sterile pinnæ, and the width (5 mm.) of the fertile pinnæ. Presl gives the first of these as distinctive of *S. juglandifolia*; as regards the fertile pinnæ he states that they have a broad margin on either side of the narrow costal fertile zone, but he does not give any measurements. Presl may perhaps have had a young fertile frond. These facts, together with Presl's citation of Cuming 133 seem to me sufficient evidence for accepting the identity of the two species in question. The only doubtful point in Presl's citation of Cuming 133 under *S. scandens*; it is possible that this was copied from John Smith.

S. juglandifolia is intermediate in character between *S. palustris* and *S. laurifolia*. When preparing my former paper I was in some doubt how to treat intermediate specimens, and finally referred them to *S. palustris*, as they were clearly not *S. laurifolia*, which is a very well-marked species as compared with the variable *S. palustris*. I think however that *S. juglandifolia* is sufficiently distinctive to warrant specific separation. Its intermediate character is seen in the following points:

	<i>S. palustris</i>	<i>S. juglandifolia</i>	<i>S. laurifolia</i>
Base of sterile pinnæ	cuneate	broadly rounded	cordate
articulation of pinnæ	complete	partial	not articulate
width of fertile pinnæ	2-3 mm.	5 mm.	7-10 mm.
vascular bundles in stipe	to about 40	intermediate	over 100
spores	tuberculate	irregular broken ridges	parallel ridges

The statement about the spores of *S. juglandifolia* is based on an examination of the spores of Milne 518 (the type of *S. Milnei*); this specimen was referred by Hooker (Spec. Fil. 5: 251) to *S. laurifolia*.

The known distribution of *S. juglandifolia* is as follows: the Philippines, New Guinea and the Solomon Islands. It therefore corresponds approximately with that of *S. laurifolia* and is within the range of *S. palustris*. It is possible that *S. juglandifolia* represents a natural hybrid between the other two species. The Philippine specimens referred to *S. juglandifolia* are as follows: LUZON. Cuming No. 133 (K, B.M., W, Copel.), Irosin (Mt. Bulusan), Prov. Sorsogon, Elmer 16253 (W, M). Los Banos, Elmer 18242 (Copel., M, W). MINDANAO. Camp Keithley, Lake Lanao, M. S. Clemens 944 (M). Butuan Subprov. Fenix 15907 (W).

S. laurifolia Presl, Epimel. 164. 1849.

I have examined the sheets of Cuming 226 (the type collection) at Kew, and find that glands are present at the bases of the pinnæ as in *S. palustris*. Hooker (Spec. Fil. 5: 251) remarks on the absence of glands as a character distinguishing this species from *S. palustris*; apparently he failed to observe them. Owing to the broad cordate bases of the pinnæ of this species, the glands are not so obvious as in *S. palustris*. Additional specimens of *S. laurifolia* are:

LUZON. Guintacutan, Tayabas, Foxworthy and Ramos 13170 (M).

MINDORO. Bulalacas, J. Bermejos 1545 (M).

LOMARIOPSIS.

L. spectabilis (Kze) Mett. Fil. Lips. 22. 1856.

Lomaria Kze Bot. Zeit. 1848: 144.

Lomariopsis leptocarpha Holttum, Gard. Bull. S.S. 5: 270, not of Fée.

In my paper above quoted I followed Underwood in regarding *Lomariopsis spectabilis* as synonymous with *L. leptocarpha*. Fée's figure of the latter agrees very well in shape of pinnæ with specimens of the former from Java. When however I examined the type of *L. leptocarpha* (Cuming 132), I found it to be a Teratophyllum; it is in fact *T. Williamsii* Und. A close inspection of Fée's figure reveals the articulation of the terminal pinna; inspection of the specimens reveals also the great difference in texture and colour. This being the case, another name is needed for the species of Lomariopsis, and fortunately such a name exists in *L. spectabilis*.

The type of *L. spectabilis* is from Java. I have not seen it, but I have seen a number of other specimens from Java, and I think there can be no doubt of the identity with this species of the specimens quoted in my former paper. I have seen one more Philippine specimen (Mt. Mariveles, Bataan Prov., Luzon, Topping 423). This is fully pinnate, but small.

There are no specimens from the Philippines which equal in size those from Java, and there is an almost complete lack of specimens from the intervening area. The Philippine specimens however are not sufficiently distinct to warrant the founding of a new species. The whole question of the distinction between species in the genus *Lomariopsis* is a very difficult one, and must wait for much more evidence in the shape of collections and field observations.

✓ **L. Brackenridgei** Carr. in Seeman, *Flora Vitiensis*, 373. 1873.

As a synonym to this species should be added *Gymnogramme subtrifoliata* Hook., formerly included by me under *L. oleandrifolia*. I have seen the type of Hooker's species at Kew, and in texture and colour it clearly resembles *L. Brackenridgei* rather than *L. oleandrifolia*, which has very coriaceous fronds of a peculiar brown colour. The type in question is a trifoliate frond of a young plant; its reference to *L. Brackenridgei* is therefore not quite certain, but there is no other recorded species from Fiji to which it could belong. The name *Lomariopsis subtrifoliata* is already occupied for Copeland's Philippine species, so that there is no question of this name replacing *L. Brackenridgei*, which is fortunate, as Hooker's type is from a very young plant, and also the validity of his original description, with two question marks, is perhaps open to doubt.

TERATOPHYLLUM.

T. Clemensiæ Holttum, *Gard. Bull. S.S. 7*: 262. 1934.

This species is closely allied to *T. rotundifoliatum* (Bonap.) but differs in the bathyphylls, which are all simply pinnate, and in the narrower fertile pinnæ (about 5 mm. wide). The original specimens were obtained on Mt. Kinabalu, British North Borneo. A further collection from Palawan has now to be reported, consisting of the characteristic bathyphylls only. It is Merrill's No. 862 from San Antonio Bay, Feb. 1903 (Philippine National Herbarium).

Teratophyllum luzonicum Holttum *Gard. Bull. S.S. 5*: 297. 1932.

This species was based on a single specimen from Luzon; the material did not include bathyphylls. A relationship to *T. rotundifoliatum* seemed probable, but was not proved owing to the incomplete specimen. Among the further Philippine collections from the herbaria at Manila and Washington which I have since examined are some from the island of Palawan which seem to be referable to this species. They consist of bathyphylls from the youngest stage onwards to sterile acrophylls, all associated together but without fertile fronds; the feature in common with the Luzon plant is therefore sterile acrophylls. It is a little uncertain in this genus to base a

determination of an incompletely known species on one stage alone, and collections of bathyphylls from the type locality of *T. luzonicum*, definitely associated with typical acrophylls, are necessary to give a final proof of identity. I think however that the identity is extremely probable; if it fails, then the Palawan plant must be a new species.

The youngest stages (simple fronds) are shown by Merrill's No. 770. The fronds are closely similar to those of *T. rotundifoliatum* and *T. Clemensiæ* (see this Bulletin Vol. 5, p. 285, fig. 37, and Vol. 7, p. 263, fig. 1). The basal lobe is perhaps more pronounced than in the other species. No. 771 shows transition (on the Washington sheet) from the youngest stage to small bipinnate bathyphylls; the latter are up to about 4 cm. long and 1.6 cm. wide, the pinnules obovate, to almost 2 mm. long. No. 773 has both sterile acrophylls and bathyphylls, and in the Kew specimen both are attached to the same rhizome. The bathyphyll on the Kew specimen is large, tripinnatifid (almost tripinnate), the segments as in the small fronds. Foxworthy's specimen has rather large bipinnate bathyphylls. The distinction from the bathyphylls of *T. aculeatum* is the obovate shape of the segments, which are rarely bifurcate.

The sterile acrophylls associated with these bathyphylls agree well with those of the type collection of *T. luzonicum*, the difference being that some of the pinnæ are a little larger. The specimens are :

PALAWAN (Paragua). E-wi-ig- River, 1700 ft. Merrill 770 (W, M). 701 (K, W, M), 773 (K, W, M). Rio Balsajan, 700 m. Foxworthy 577 (M).

T. leptocarpum (Fée) Holttum comb. nov.

Lomariopsis leptocarpa Fée, Acrost. 69, t. 29. 1845.

Teratophyllum Williamsii Holtt. Gard. Bull. S.S. 5: 292, with synonyms. 1932.

As mentioned above, I have discovered that *Lomariopsis leptocarpa* Fée, represented by the type Cuming 132, is a *Teratophyllum*, and is identical with the species later named *Stenochlæna Williamsii* by Underwood. Fée's name must therefore be used, as the oldest. The specimen at the British Museum consists of an adult sterile frond, agreeing in all respects with *T. Williamsii*. No bathyphylls were represented in the collection, for which reason Fée included the species under the heading "frondibus homomorphis". As the shape of the pinnæ is very like that of the pinnæ of *Lomariopsis spectabilis* the discrimination of the two species from figures is not easy.

Among the Philippine specimens which I have recently examined are a few which show the early stages and normal bathyphylls more completely. The youngest stage is still not

represented, but there are bathyphylls of only 2.8 cm. long; these show no signs of a dimidiate condition. The small bathyphylls show the same character of narrowly linear ultimate segments as the larger bathyphylls; only the very youngest stages have rather broader segments, still with parallel sides. Nearly all specimens, bathyphylls included, show the pronounced red colour on drying. Additional specimens are :

LUZON. Prov. Bataan, Curran 19152 (M), C.B. Robinson s.n. Aug. 1908 (M), P. T. Barnes 85 (M, W). Apayao subprov. Fenix 28276 (M).

T. aculeatum (Bl.) Mett.

There are a number of further collections from the Philippines, chiefly of bathyphylls, which indicate that this species is typically represented in the Philippines, though there are no very young or fully dimidiate stages.

One collection (Rizal Prov., Ahern's Collector, Forestry Bureau No. 2695) has very remarkable large normal bathyphylls, to 16 cm. long and 8 cm. wide. The general character of the pinnæ is similar to *T. aculeatum*, but there are no other specimens at all comparable in size. It is possible that they represent another species.